

Presentation on United States Academic Standards Education Courses to NIST/ICES International Standards Education Workshop

February 21, 2008

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United States National Standards Strategy for Standards Education

- [To] develop or significantly enhance standards education programs that address the needs of specific groups within the United States. These programs must reflect the multidisciplinary environment in which standards development takes place and address national and international standards development procedures; the relationship between private and public sector standards; the environment, health, safety, sustainability, international trade, public policy, competition, legal, economic benefits, and strategic considerations; and how to balance the interests of stakeholders.

(http://www.ansi.org/standards_activities/nss/usss.aspx?menuid=3,
US National Standards Strategy, as amended, Section 10, at page 15 (2005))



Nature of United States Standardization System and Standards Education

- The diverse, sector-based United States Standardization System (more than 600 standards groups) creates significant challenges for development of comprehensive standards education programs in the academic sector, for example:
 - It is easier to develop standards education programs in the private and public sectors, typically on-the-job training programs, because the needs of these sectors are much greater than the academic sector. It is critical for most, if not all, private and public sector organizations to effectively develop standards in order to fulfill their purpose and responsibilities.
 - In short, it is absolutely essential that private and public sector organizations have a group of experienced, well educated standardization experts in order to survive in a world where globalization is rampant.
 - It is much more difficult, however, for the academic sector to develop comprehensive standards education programs because the need for such programs is not as great as with the private and public sectors.

Strategic Value of Standards

**Standards are a bridge between
markets and technologies**

Markets:

- Consumer
- Commercial
- Government

Technologies



**Whoever controls the bridge
controls the future...**



United States Academic Sector

- There are approximately 2,500 universities and colleges in the United States academic sector. The subjects of standards and standardization are discussed in many subject areas within the academic sector, for example, engineering, science, economics, business, public policy, and international trade.
- There are, however, only four university courses in the United States dedicated to the study of standards and standardization:
 - “Strategic Standardization” (Catholic University),
<http://engineering.cua.edu/engrmgmt/curriculum//CMGT%20564.cfm>
 - “Standardization and Standards Wars” (University of Colorado-Boulder),
<http://caete.colorado.edu/courses/detail.aspx?coID=217>
 - “Web Technologies and Standards” (University of Pittsburgh),
http://www2.sis.pitt.edu/~dist/academics/specializations/course_db.html
 - “Technological Standards as Regulations” (Yale University Law School),
<http://isp.law.yale.edu/tags/reading+group/default.aspx>



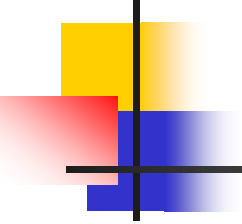
Why Only 4 Standardization Courses in the United States Academic Sector?

- The United States academic sector does not believe there is a need for an entire course dedicated to the study of standards and/or standardization. In short, the need to develop standards education courses in the academic sector is substantially less than the need which exists in the private and public sectors. *(See (1) Survey, The Center for Global Standards Analysis (“Center”) on Standards Education Perspectives in US Schools of Engineering (2004); (2) Center Survey on Standards Education. (2003). See also, e.g., Conference Program Presentations, 2007 SIIT Conference, University of Calgary, Canada www.siit2007.org)*
- There is an absence of faculty in the academic sector with the experience and skills necessary to teach a course on standards and/or standardization.
- There is an absence of available resources to develop standardization courses even on an experimental basis. In short, absent a proven need for a standards education course, very few universities or colleges will establish such course.



Need for Standards Education

- Globalization is rampant and will remain so for the foreseeable future. (*The World is Flat*, Thomas Friedman (2005); <http://www.thomaslfriedman.com/worldisflat.htm>)
- Standards directly affect more than 80% of global trade with an estimated value exceeding \$7 trillion (US). (US Congressional Hearing (May 2005); http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_house_hearings&docid=f:20998.wais)
- Standards influence everything we do. (UK Standards Strategy (2003); <http://publicaa.ansi.org/sites/apdl/Documents/Standards%20Activities/NSSC/UK%20NSSF.pdf>)
- Standards control markets. (German Standards Strategy (2005); http://www.din.de/sixcms_upload/media/2896/DNS_english%5B1%5D.pdf)
- Standardization is one of the best sources of competitive intelligence available. (Canada Standards Strategy (2005); <http://www.scc.ca/en/nss/css-scn/index.shtml>)



ABET Engineering Standards Education Requirement

- ABET is the national accreditation body for engineering schools in the United States.
- In 2000, ABET established the following standards education requirement for “engineering standards”:
 - The curriculum must prepare students for engineering practice culminating in a major design experience based on the knowledge and skills acquired in earlier coursework and incorporating engineering standards and realistic constraints that include most of the following considerations: economic, environmental, sustainability, manufacturability, ethical, health and safety, social, and political.
(<http://www.ele.uri.edu/faculty/daly/criteria.2000.html> ; Criterion 4: Professional Requirements)



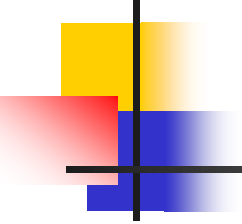
Manufacturing Competitiveness Act of 2007

STANDARDS EDUCATION PROGRAM

- (a) Program Authorized- (1) As part of the Teacher Science and Technology Enhancement Institute Program, the Director of the National Institute of Standards and Technology shall carry out a Standards Education program to award grants to institutions of higher education to support efforts by such institutions to develop curricula on the role of standards in the fields of engineering, business, science, and economics. The curricula should address topics such as--
 - (A) development of technical standards;
 - (B) demonstrating conformity to standards;
 - (C) intellectual property and antitrust issues;
 - (D) standardization as a key element of business strategy;
 - (E) survey of organizations that develop standards;
 - (F) the standards life cycle;
 - (G) case studies in effective standardization;
 - (H) managing standardization activities; and
 - (I) managing organizations that develop standards.
- (2) Grants shall be awarded under this section on a competitive, merit-reviewed basis and shall require cost-sharing from non-Federal sources.
- (See H.R. 255, Sec. 7, introduced in the U.S. Congress January 2007)

Standards Course

Academic Development Checklist

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- Demonstrated need for a standards course
 - Available resources
 - Academic (students)
 - Private sector
 - Public Sector
 - Experienced faculty
 - University Approval
 - Content
 - Course Focus: engineering, science, economics, business, public policy, and/or international trade
 - Scope: national, multi-national, and/or global
 - Testimony of experts
 - Access to standards programs & printed standards
 - Education Forum(s): classroom or internet
 - Support networks



Is Development of Standards Education Courses a Priority in the United States Academic Sector?

- Creation of standards education courses within the academic sector is not yet a priority, however, it is essential for creation of such courses by the academic sector to become a priority.
- For over 100 years, the United States private and public sectors have created and relied upon standards education programs, typically on-the-job or mentoring programs, because of the critical need to create an experienced group of standardization experts to survive.
- The future of the United States economy depends, in part, upon the academic sector accepting expanded responsibilities in standards education to effectively sustain international economic development in a world dominated by globalization.



Interdisciplinary Approach to Standards Education

- The Center for Global Standards Analysis strongly recommends an interdisciplinary approach to standards education which includes covering issues such as technology, economics, business concerns, international trade, intellectual property, sustainability, public policy and law.
- The significant increase in creation of academic sector standards education programs offer significant opportunities to stimulate economic growth worldwide, however, it is of critical importance to understand that standards are developed in a dynamic interdisciplinary environment.
- The most important education forum for standards education is the interdisciplinary environment of group meetings where standards are being negotiated and developed in the private and public sectors.
- It is of great importance, therefore, that academic standards education programs seek development of an interdisciplinary approach, and, where possible, seek joint education opportunities with standardization development forums in the private and public sectors.



Attachments

- “*A Survey of Schools of Engineering In the United States concerning Standards Education,*” published by The Center for Global Standards Analysis (March 2004).
- “*A Standards Education Survey,*” published by The Center for Global Standards Analysis (March 2003).



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